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THE PHILIPPINE ISLANDS AND THEIR PEOPLE

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There are 7,083 separate islands in the Philippine group, 463 having an area of more than one square mile. They extend over 16 degrees of latitude, a distance of more than 1,100 miles. If a map of the Philippines were superimposed upon a map of the United States, the islands would extend from the Gulf of Mexico to the latitude of Minneapolis and Montreal (Fig. 1). Suppose Manila were placed at St. Louis, then Aparri would be on the Illinois-Wisconsin boundary about 60 miles west of Lake Michigan, and the southeastern tip of Luzon would lie within Tennessee. Davao, the chief city of Mindanao, would be located at the southeastern corner of Alabama; New Orleans would be covered by the Island of Jolo, the largest of the Sulu Group; and Palawan would extend southwestward almost to Dallas, Texas.

The total area of this American outpost (115,000 square miles) is slightly more than twice that of the state of Illinois, or about equal to the combined area of New York, Pennsylvania, and West Virginia, and each of the eleven largest islands has an area greater than that of Rhode Island. These eleven islands contain about 95 per cent of the total land area, but approximately two-thirds of it is within the two larger islands of Luzon and Mindanao (Fig. 2). These two have an area of 41,000 and 37,000 square miles respectively, that is, they are equal in size to the states of Ohio and Indiana respectively.

GEOLOGICAL HISTORY

The origin of the Philippines, many of which are merely mountain peaks protruding from the sea, is associated with the great age of folding which the geologist calls the post-Tertiary upheaval. This was the era of mountain building that changed the features

of Europe and Asia so decidedly, producing the extensive mountain systems of Southern Europe, Western Asia, the vast Himalayas, the Malay Peninsula, and the East Indies. Apparently, the Philippines are a result of this vast chain of Asiatic mountains redoubling upon themselves. Because of the marked similarity of animal life in the Philippine Islands and on the Asiatic mainland, it is believed that there was once a land connection between the two, probably subsequent to the period of intense folding.

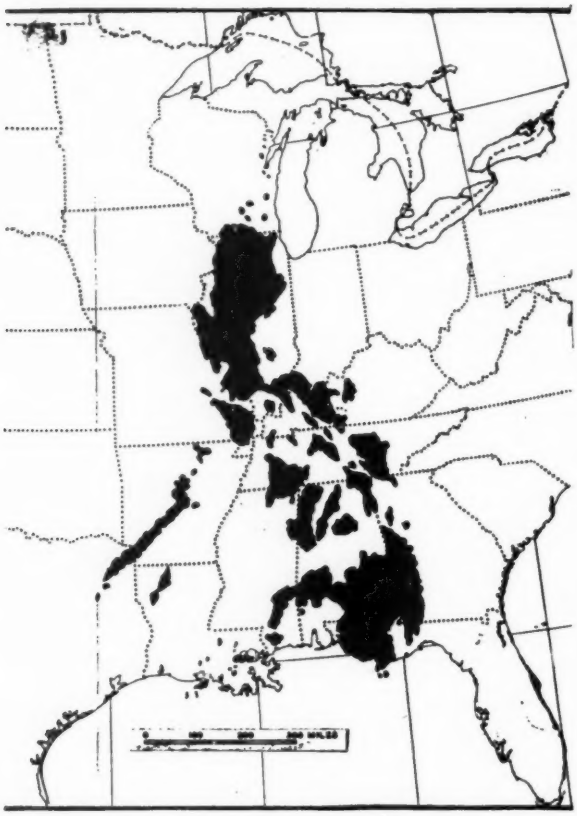

Fig. 1. If the Philippine Islands were superimposed upon the United States they would extend from the Gulf Coast to the boundary between Wisconsin and the upper peninsula of Michigan.

Structurally, the islands are a series of folds trending in a north-south direction. In some cases the synclines or troughs form the valleys between the Cordillera ranges, the anticlines; in other instances they dip below sea level and are the straits and seas between the numerous islands. The surface ranges from narrow coastal plains and fertile alluvial valleys to vast mountain heights, as majestic Mt. Apo (9,690 feet) in Mindanao and Mt. Mayon, the perfectly symmetrical, volcanic cone in southern Luzon. The latter is still active periodically, the most recent period of activity occurring in 1938. That the surface is still being changed is illustrated very colorfully by Worchester[1] who states that it is not unusual to have a

[1] D. C. Worchester, The Philippine Islands, p. 69.

native assure you that he is now fishing where his father lived, or vice versa.

CLIMATE

The climate is really a surprise to the uninformed individual. Because of their insular and latitudinal position, the temperature never approaches the extremes experienced in our midwestern states. (The mean annual range of temperature varies from one to eleven degrees at the different Philippine weather stations.) Snow is unknown but frost occurs on the higher mountains and above an elevation of 6,000 feet a thin sheet of ice occurs infrequently. Hence, altitude exerts a greater influence on climate than does the latitude.

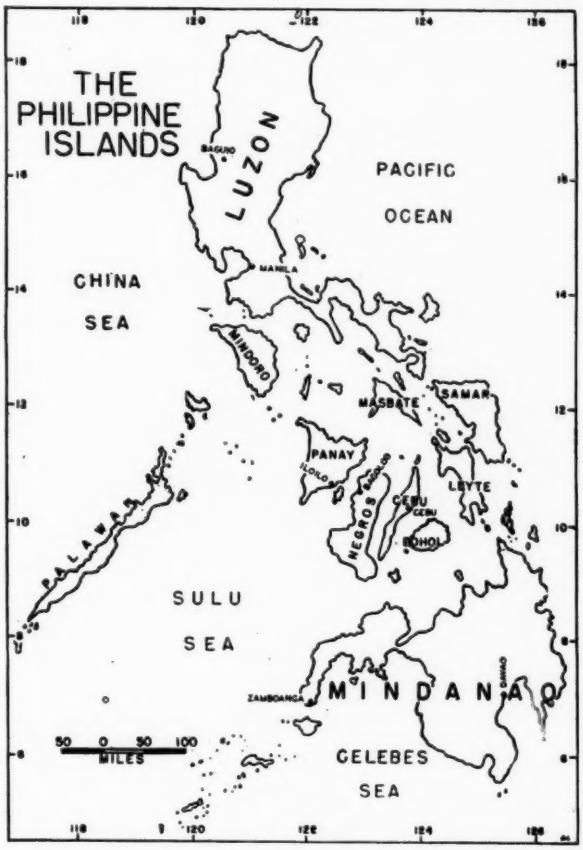

Fig. 2. The Philippines include two large islands, Luzon and Mindanao, nine others of more than 1,000 square miles each, and more than 7,000 smaller islands of less significance.

Altho situated within the so-called non-seasonal tropics, the year is divided into three periods of somewhat diverse climatic conditions. The cool season, which lasts from the first of November to the middle of March is dry and has an average temperature in the low or middle seventies. This is followed by a shorter period lasting until the middle of June which is hot and still dry. It is quite warm during the middle of the day but the temperatures are not as high as the maximum experienced in

our own country as the thermometer rarely reaches 100 degrees Fahrenheit and a covering is always needed at night. During the period of greatest heat, May and June, severe local thunderstorms may occur. The third period is the rainy season from June through October. The actual temperature is not high because of the high percentage of cloudy weather and frequent rains, but the sensible or body temperature is extreme for the humidity is excessive. Traveling is oftentimes difficult, but the Occidentals welcome the mud and slush in preference to the stifling, hot, dry season that precedes these conditions.

This seasonal diversion is true over most of the area, but the eastern margin of the Islands experiences no dry season. During the cooler months the precipitation results from the normal northeast trade winds which give up moisture along the windward coasts. During the warmer months the monsoon winds, roughly southerly in direction, bring rain to all parts of the Archipelago. The northern and central islands also receive precipitation from typhoons or tropical cyclones similar to those experienced on our Gulf Coast and in the West Indies. These violent storms are most frequent from July to October and travel from an east or southeast direction. The majority of them pass over the northern islands but the centers of some of them pass a considerable distance north of the Philippines.

NATIVE VEGETATION

Forests cover almost two-thirds of the 75 million acres within the Philippine Islands, grass lands occupy one-fifth of the area, and one-eighth is under cultivation. Thus the total land in cultivated crops is equal to about one-fourth the area of Illinois. The forests are composed of both virgin timber and worthless second growth, but the latter constitutes less than one-fifth the total. The commercially exploitable virgin forest, located principally in the mountainous districts, is distinctly of the equatorial type (hardwoods, dye woods, bamboos, rattans) in the southern islands but tends to grade into a more temperate variety in the higher altitudes of Luzon. However, the oak is found only above an altitude of 4,000 or 5,000 feet. There is an exuberant growth of varied vegetation in the shade of these tropical trees. Innumerable varieties of orchids and parasitic plants, vast areas of ferns, and great climbing rattans are scattered indiscriminately thruout the area.

Some of the rattans are of sufficient length and strength that they are used for ferry cables.

INHABITANTS OF THE ISLANDS

The original population, tho probably quite sparse, was negroid in character;[2] they were extremely small, black individuals, with kinky hair, thick lips, and flattened noses. Of these original inhabitants only the primitive mountain tribes, the Negritos—the former head-hunters of Luzon, survive. These people were forced into the more inaccessible regions by the invasions of the Indonesians in the northern islands, and later by the Malays in the southern islands. From these last two groups came the true Filipino, the people Magellan saw in July 1521, and the people with whom the Spanish had to deal when the first colony was planted in 1565. A large number of people having mixed racial characteristics, part Spanish and part Malay or Filipino, are the result of the four hundred years of Spanish rule. These individuals were and still are known as "Mestizos," this being the Spanish word for anyone with mixed blood. In the early decades of the twentieth century there was an influx of Chinese into the Archipelago. The pure Chinese, altho only one-half of one per cent of the total population, tend to dominate the commercial life.[3] From this yellow invasion has developed another group of mixed-blooded people known as the "Chinese Mestizos."

Still more recently many Japanese immigrated to the Philippines. Altho they settled thruout the islands they are most numerous along the moist eastern coast, the regions of abaca production. (The Manila hemp industry has been largely taken over by the industrious Japanese, as the native Filipino does not relish hemp stripping and the strenuous hand labor that accompanies the process.) The Japanese have been especially active and for several years have practically controlled the province of Davao, Mindanao. The capital city of the same name was, in many respects, a Nipponese center and it was connected with Tokyo by regular steamship service. It is unnecessary to state that this was one of the first areas controlled by the Japanese last December.

The term "Filipinos" is applied to the inhabitants of the

[2] R. W. Hart, The Philippines Today, (1928), p. 95.

[3] *U. S. Bur. of For. and Dom. Com.*, The Philippine Islands, A Commercial Survey, Trade Promotion Series No. 52, 1927, p. 9.

Islands, irrespective of physical characteristics altho current usage tends to restrict it to the more active and progressive peoples and usually to those professing the Christian faith. The Christian Filipinos make up 90 per cent of the population, and are the representative peoples of the Islands.[4] These natives came under the influence of the early missionaries and were molded into a new type. Their culture is a mixture of native, Spanish, and American customs in various stages of fusion. The people are a well-integrated unit and their progress and adaptability has been remarkable.

The Census Bureau, for want of a better classification, has grouped the inhabitants into Christian and non-Christian peoples. The Moros, most of whom live in Mindanao and the Sulu Islands, are the most numerous of the latter group. Their origin was probably little different from that of the other inhabitants, but they came under the influence of Mohammedanism sometime during the fourteenth century,[5] and their chief characteristic is an almost fanatical adherence to that faith. They were among the last people to submit to American occupation and the Japanese are finding that their 1942 attitude toward foreign occupation is no different than it was 40 years ago. In the Islands they occupy a position somewhat analogous to that of the American Indian a century ago, but to those who know them intimately they appear kind and lovable, yet proud and fearless.

The Christian inhabitants are divided into eight ethnographic groups, each possessing characteristics, including its own language, which sets it off from the others. Of these, the three largest and most important groups are: (1) the Visayans who inhabit the islands between Luzon and Mindoro on the north and Mindanao on the south; (2) the Tagalogs who live in the provinces around Manila Bay; and (3) the Ilocanos who occupy three narrow coastal provinces in northwestern Luzon, altho in recent years they have overflowed into nearby provinces while some of their numbers have migrated to Mindanao and Hawaii. Many of these people are business men and they have been referred to as the "Yankees of the Philippines." Probably this is not entirely a matter of choice for their home provinces are in the dryer, less fertile section of the islands.

[4] Haas, W. H., (Ed.), The American Empire, p. 314.
[5] *Ibid.* p. 317.

Despite the various local languages and dialects (87 are recognized), English is becoming the universal tongue. The leading Philippine newspapers and magazines are printed in English and every Filipino seeks to learn it. About one-half the population can read and write. Spanish is still used locally, but it has ceased to be the official language.

DISTRIBUTION OF POPULATION

There are almost two and one-half times as many people in the Philippines as in Australia. The increase in population during American occupation has been astounding as the number of people has doubled since Spanish control (Table I). The reason for this

TABLE I

PHILIPPINE POPULATION

Year	*Number of inhabitants*
1903	7,635,426
1918	10,314,310
1930	12,588,066
1940	16,000,313

rapid increase is not readily apparent, but the birth rate in 1940 was four per cent, only Japan and Java having a speedier increase. Probably that is sufficient explanation. The population, however, is not uniformly distributed. In some parts there is not enough land for the farmers to cultivate, in others there are not enough people to cultivate the vast tracts of virgin domain. Of the larger islands, Cebu has 628 persons per square mile but isolated, rocky Palawan has only 21 per square mile. The average for Mindanao is 34, but Agusan, a province of fertile alluvial soil, has a density of only 15. The central plain of Luzon has a density of 364 but in rugged Neuva Viscaya Province it is only 13½. However, in recent years there has been a migration of native Filipinos from Luzon and the more densely populated Visayan Islands to the sparsely populated alluvial areas of Mindanao.

There are only a few large cities in the islands, and the urban center of some of those is small (Table II). Manila, at the mouth of the Pasig River facing the wide, but shallow Manila Bay, has a little of everything. It is not only the capital and largest city but the leading port and manufacturing center, possessing an 80 mile system of industrial canals. Cebu, on the densely populated island of the same name, is the leading city of the middle islands, but in

some respects has been surpassed by Iloilo. The latter has a better harbor and more suitable port facilities, its rise having somewhat paralleled the rise in sugar production on Panay and Negros for which it serves as the principal outlet.[6] In Mindanao, Zamboanga and Davao are most important, while secondary cities on Luzon are Legaspi, Batangas, Lingayen, Vigan, Aparri, and Baguio. The last named city, located in the highlands 125 miles north of Manila,

TABLE II

PRINCIPAL CITIES OF THE PHILIPPINES

City	*Population, 1939*
Manila, Luzon	623,493
Cebu, Cebu	146,817
Zamboanga, Mindanao	131,455
Davao, Mindanao	95,546
Iloilo, Panay	90,480
Bacolod, Negros	57,474

is the summer capital and is near the gold mining area of Mountain Province. It has grown from a village of pine shacks and Igorot huts to a modern city of 25,000 people (many more during the hot season), having paved streets, theatres, modern hotels, and fine markets.

ECONOMIC LIFE

The Filipinos are essentially agriculturists. Altho the standard of living in the upper strata of Philippine society is comparable to that of well-to-do Americans, the vast majority till the soil as small landed proprietors or tenants, or they work as laborers on the larger sugar, hemp, tobacco, or rice estates. Their home, usually, is a one- or two-room bamboo house constructed by their own labors. Furniture is scarce and often primitive. The entire family sleeps on pillows spread on the split bamboo floor of the living room. The staple food is rice, but it is supplemented by fruits, a few vegetables, and products of the poultry yard, pig pen, fish pond, or the nearby river and sea. The clothing requirements are dictated by the slight needs of the tropical climate rather than by the changing demands of fashion.[7]

About one-eighth of the total land area is cultivated and the major portion of Philippine exports has been agricultural prod-

[6] Alden Cutshall, Trends of Philippine Sugar Production. *Economic Geography*, Vol. 14, 1938, p. 156.

[7] Joseph R. Hayden, The Philippines, The Macmillan Company, New York, 1942, p. 23.

ucts. Until recently, the value of the coconut oil alone exceeded that of the mineral output of the Archipelago. Types of agriculture vary from the large sugar plantations to the intensive horticulture of abaca by the Japanese in Mindanao. In the less densely populated islands there is a type of shifting subsistence agriculture. The brush is cut during the dry season and burned when it is thoroly dry. The wood ashes that result fertilize the soil, but weeds grow rapidly as soon as the rains begin. Plowing is never done and the stumps and roots are not removed. The seeds are planted in small, shallow holes and only crudely cultivated, if at all.[8]

Altho there are many small landowners in the Philippines, the proportion of landless people is shockingly high for an overwhelming agricultural country in which there is little industry and only one large city. Less than 40 per cent of the 3,143,886 families comprising the inhabitants own both house and land. A little over 40 per cent own homes on rented sites.[9] The percentage of ownership is lowest in the fertile areas around Manila Bay, and in the sugar areas of Negros and Panay; whereas most of the people own their land in northern Luzon, on the island of Bohol, and in the Provinces of Surigao and Bukidnon, Mindanao. Most of the farms are small, averaging about three acres each and are, to a large extent, concentrated in the fertile valleys and coastal areas.

The islands are located in a latitude that, except in the higher altitudes, gives them a 365-day growing season; thus two or more of many crops may be grown during the year, and animal forage and shelter is a small item. Their insular position permits them to escape the extremes of continental climate characteristic of a large land mass. This position also accounts for the fact that ample precipitation occurs over most of the area. Even in the regions that have a dry season of several months, there is still sufficient time to produce adequate food during the remainder of the year. Because of the variable climate and soil, a variety of cultivated crops can be grown: rice and tobacco in the fertile river valleys, coconuts on the sandy coasts, corn on the coraline soils of the central provinces, abaca on the moist eastern slopes, sugar cane on the fertile island of Negros and in the valleys of Luzon, and sweet potatoes on the more rocky uplands. Rubber and pineapples offer possibili-

[8] Robert L. Pendleton, Land Utilization and Agriculture of Mindanao, Philippine Islands, *Geographical Review*, Vol. 32, 1942, p. 195.

[9] *American Chamber of Commerce Journal*, Vol. 2 (Oct. 1940), p. 8.

ties for the future, altho the Goodyear Plantation on the Zamboanga Peninsula of Mindanao and a major pineapple plantation at Del Monte on the same island are the only extensive developments.

When the United States came into possession of the Islands in 1898, crude methods of cultivation were widespread and scientific knowledge even less developed. Since American occupation, and with American assistance, there has been a constant and rapid improvement in both. Agricultural experiment stations were established on many of the islands. New varieties of many of the long cultivated crops were introduced. Many plants (pineapple, peanuts, rubber, cassava, roselle, and numerous vegetables) that were entirely new to the Archipelago were taken from the United States, Mexico, Central and South America, Hawaii, or Asia and given a successful start. As an added incentive to the agriculturists, rural credit associations and agriculture schools were established. The Philippine Legislature encouraged this basic industry with liberal homestead laws and cheap government land.

The vast timber resources of the islands, like the mineral wealth, have only recently been worked to any appreciable extent, but both have occupied a significant role in recent years. The value of Philippine mineral production doubled between 1931 and 1936; then the 1936 figure was tripled by 1940.[10] Ten or fifteen years ago the value of lumber products was about equal to that of minerals, but the increase, altho significant, has been considerably less rapid than that of mineral production.

It is only, during the past decade that mining has become an important industry, and about a quarter of a million people depend upon it for their living. Gold production amounts to about 80 per cent of the total value of the mineral products. It exceeds that of Alaska, and California is the only state having a greater production. Mindanao iron ore reserves have been estimated at 500 million tons, one of the larger ore bodies of the world. The chromite deposits north of Manila are estimated at ten million tons and the islands supplied about one-fourth the United States chrome imports of 1940. Silver is associated with most of the gold ores, while manganese, copper, lead, and zinc follow in that order. The big handicap is mineral fuels. Altho petroleum seeps have been found, no producing wells have ever been brought in. Coal deposits are

[10] Alden Cutshall, Mineral Resources of the Philippine Islands, *The Scientific Monthly*, Vol. 54, 1942, p. 295.

widespread but the beds are thin, and oftentimes broken by surface movement. Moreover, the coals are young and no coking coal is known to exist on the islands.[11]

The rapid increase in population, accompanied by a rising standard of living, which has occurred in the present century has been achieved almost entirely by the development of the agricultural resources and by the sale of most of their products in the duty-free American markets. (They are our fifth best overseas customer.) Nevertheless, the vast timber and mineral resources are sufficiently great that, under favorable political conditions, a more independent economy could in time be developed. In the last few years the farmers, under government encouragement, have grown less sugar cane and more rice. Manila hemp and coconut products can be sold at a profit even without tariff protection. The same is probably true of tobacco and cigars, sisal, and probably some of the products of lesser importance.

Economically, the Philippine people have been too dependent upon export crops. They have preferred to adopt the white man's method of living, which meant that they must sell to him in order to get the means of obtaining the desirable commodities. One-third of the land in crops is planted to coconuts and 30 per cent of the people are dependent upon the coconut for their income. Another 10 per cent are dependent upon sugar which, in value, is the leading export crop. (The government owned Manila Railroad derives 30 to 40 per cent of its revenue from freight charges on sugar.) A half million people depend upon the abaca industry and a quarter of a million on tobacco. These four crops, together with lumber and embroidery, furnish the means of sustenance for half the 16 million people of the Islands.[12] The mining too is primarily for export. Except for an insignificant amount of iron ore the metals or their ores have been exported to the United States or Japan.

[11] *Ibid. passim.*

[12] E. Wallace Moore, Plight of the Philippines, *Asia*, Vol. 61, p. 405.

TO MONTENEGRO BY BUS

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The only method of travel to old Montenegro, known in Jugoslavia as Črna Gora, is by highway. The one bus which leaves Dubrovnik somewhere around six o'clock in the morning travels along the cliff-like coast, then cuts across an inland valley and skirts the numerous indentations along the bay to reach Kotor. From here, the bus climbs the switchbacks of the Lovčen Mountains, rolls along an upland plateau, hurtles another series of switchbacks,

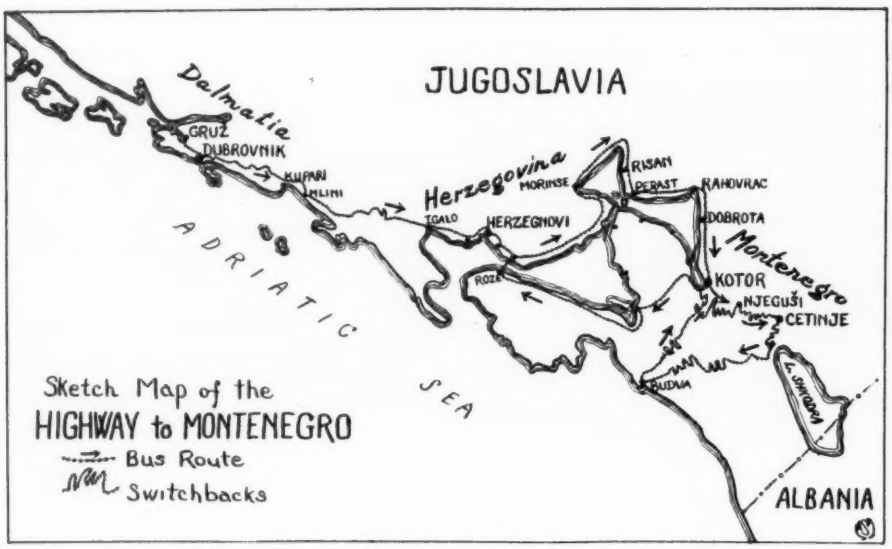

Fig. 1. Sketch map of the highway to Montenegro.

and then tumbles into the plain on which is Cetinje, the old capital city. The return trip continues on to within sight of Albania, curls down the coast to Budva, crosses a few more ridges and eventually retraces the last portion of the outbound route. The entire trip covers some 200 miles (Fig. 1). There are frequent stops at bus depots and at crossroads to leave passengers, mail, packages, or to take on newcomers. Some glimpses of the countryside that could be seen in the thirteen hours of travel on such a journey will be described.

THE BUS DEPARTS

It was a chilly morning in early May. The open bus was already well filled with Jugoslavs tho two places up front had been reserved for the "tourists." Departing with a fanfare which consisted of much tooting of the horn and laughter of the passengers, the bus lurched down hill from the hotel, swung around a narrow corner, wheezed uphill beside the walls of the old Turkish fortifications, and passed thru the city gate (Fig. 2).

Fig. 2. View of Dubrovnik showing old Turkish fort.

The bus continued up hill and was now speeding along a black-topped highway. Soon a sign pointed to Kupari (Baths), a small resort, that lay a mile off to the right on a pleasant blue bay. Shortly the bus arrived at Mlini (Mills), a characteristic rural village in which produce was raised for the city of Dubrovnik. The gardens were crowded with lettuce, cabbage, peas, and potato plants in blossom. The common trees on the landscape included olive, fig, cypress, poplar, mulberry, and live oak. The unreclaimed hillsides were almost too stony for pastures tho clumps of shrubs and bushes struggled for existence. The fragrance of rosemary and thyme filled the morning air already refreshed by the heavy dew. Bushes

of vivid yellow flowers and low creeping vines with purple blossoms ran wild over stone walls. Oleanders grew along the roadside.

At Kontrola, a crossroads stopping place, the bus paused. At the corner stood a small bus that had collected milk cans from a distance of two miles along the side roads. The supply was being loaded on the roof of a larger bus which traveled the main road. Just then everyone's attention was directed to a passing bus going toward Dubrovnik carrying a crowd of jolly passengers dressed in native costume. The men wore large red hats; the women wore large white starched headgear.

THE VALLEY SCENE

The Adriatic Sea was no longer visible. Here and there in a field or along a field margin stood a lone cypress or poplar. The bus was now traveling on loose gravel. The route wound into a wide fruitful valley covered with vineyards. Stone walls up to six feet in height separated the fields and bordered the roadways. Some gardens found footing on the slopes to the right of the highway. Goats and sheep grazed at random. Donkeys with their wooden saddles moved in a slow uncertain gait toward the city.

Near Gruda, piles of dead vines and roots were tied into bundles of fuel wood. At a corner store hung the two ever-present signs: Singer Šivaci Strojevi and Bata. The former had the usual trade-mark in green and with with the lady at the sewing machine; the shoe sign was a white panel with black letters.

Reddish brown soil was most common, tho parts of the valley appeared to have a muck type. A few workers were already in the fields. Over there, a peasant with spray equipment fastened to his back was busy in the vineyard. Some of the men wore the native costume of that district: large star-shaped hat, blouse, vest, baggy pantaloons, long hose, and sandals.

The bus stopped frequently to quiet the kicking donkey which blocked the highway or to wait for sheep and goats to move off the road. Small groups of children straggling on their way to school stopped to wave at the passing bus. From time to time along the side of the road were box-like concrete forms dated 1925. These troughs and fountains supplied the inhabitants with water for domestic use and for livestock. As for the surface streams, their channels were either dry or had very little water. Numerous stone and concrete dams had been built across stream courses and

gulleys to reduce erosion. From the farther side of the valley, threatening clouds began to roll down from the summits of the mountain range, casting shadows on the narrowing valley. At a lonesome turn in the road stood a "Posta," nearby a small barracks. From here the bus moved over low ridges thru an isolated district. At Igalo, the land opened to the coast. Lombardy poplars and palms again made their appearance.

Along the Coast

The bus arrived at Herzegnovi. Evidences clearly indicated that the navy was in port. Many sailors pedaled bicycles from the nearby naval base to the town to frequent the shops and cafes. From some of the streets, flights of stairs led to the residential section on the hills above the narrow main highway. At the farther edge of Herzegnovi stood more ruins of old Turkish walls and towers.

After a brief stop, the bus resumed the journey. The dusty highway now edged around a rock bluff and down to the shore where a sprinkler wagon was operating. It had just settled the dust on the road as far as the navy yards and barracks beyond the town. Twelve blue-grey vessels of various types, the Jugoslav Navy, were at anchor in the sheltered bay. Beyond was a hydroplane base with six planes at their moorings. To the left was a power station. It was enclosed by a high wire fence on which was the warning "Do not photograph." The sign showed an open Kodak with a red "X" drawn thru the picture. In the midst of all these evidences of military preparedness, villagers and coast dwellers were at work on their fish nets. Donkeys loaded with wood, and women with bags of charcoal on their backs moved toward town. In the sheltered coves along which the bus passed were groups of camouflaged oil tanks. Barges moved quietly about the bay. Isles, castles, and fishing boats were tucked into other inlets. The scene was brightened by the fruit trees in blossom and by the profusion of flowers in the gardens and along the roadside in hamlets as Morinse and Risan. On the church tower at Perast was the date 1681.

The bus bumped along the highway, hugging the very edge of the water, following every indentation of the bay. It was thus possible to see some of the settlements long before reaching them, and to see them again from across the water. On this far side of the bay, the overhanging cliffs and tree-covered rock hills overshadowed the road. From underneath the highway, streams gushed

thru the rock burden to reach the bay. As the road approached the promontory on which Kotor is located, the bus passed army barracks and fields in which soldiers were at drill. Just outside the city walls, the bus crossed a moat by means of a small wooden bridge. At nine-thirty o'clock the bus stopped outside the gates of Kotor.

Kotor, with more than 5,000 inhabitants, fills the narrow coastal plain and extends into the foothills of the mountains that bear down upon it. Turkish walls and fortifications surround the old town and

Fig. 3. The Serpentine hurdles the Lovčen Mts. as the highway to Cetinje leaves Kotor.

climb directly into the hills. The markets for fruits, vegetables, and flowers are outside the old wall along the highway while the shopping center is within the gate.

At ten o'clock the bus driver started up the motor. The passengers soon collected; the newcomers were forced to stand. The exciting climb over the coast range, the Lovčen, was to start.

The Lovčen Serpentine

For a few blocks the bus paralleled the old walls, then passed over the narrow streets of the residential area. Abruptly the road began to ascend. (Fig. 3). By means of the Serpentine, the bus switchbacked for more than an hour on the up-grade gravel road. Guard rails and stone fences protected a few of the steeper slopes.

At two of the corners, the bus had to pull forward, back up, and then proceed in order to maneuver the curve. At Eagle's Lookout, beyond the halfway mark, two armed soldiers stood at attention to salute as the bus passed by.

A descending car approached. Many of the passengers shouted to the drivers that the two cars would meet at the next curve. To the accompaniment of back-seat driving, calling of greetings, and hysterical laughter, the cars passed in safety. The passengers

Fig. 4. The highway drops off the mountains and cuts across the open valley to Cetinje in the distance.

breathed a sigh of relief, regained their composure, and settled back in their places for the remainder of the trip.

At last the bus gained the twenty-fifth switchback and rolled across an upland plateau of stones and poor pasture. An occasional stone hut and group of stone buildings marked a farmstead. Here and there, tiny fields of garden stuff and grain were hemmed in by the stones that had been cleared from that field. Irregular shadows were cast by the clouds that gathered about the snow-covered summits of the higher mountains that lie back of the coast range. On this upland, settlements appeared to be mere place names for, other than a small store, neither population nor dwell-

ings were in evidence. The bus rumbled to a stop in the second village. It was Njeguši, at one time the capital of old Montenegro.

From this dry stony almost treeless tract, the bus moved toward a second range of mountains. The serpentine with thirty-two switchbacks loomed ahead. This road was narrower and less improved than the one out from Kotor. From the summit of the Pass, 4,200 feet above sea level, the bus descended rapidly by means of a few short turns to the open valley floor (Fig. 4). The road now ran directly into bleak Cetinje, the capital of the former province* of Montenegro.

IN CETINJE

The bus parked on a side street. Wraps were left in the open car before starting on a walking tour of the town. Here and there, street and building repairs were in progress. People trudged in the street with the wares purchased in the open market place. Men seemed to carry on most of the business, tho a few housewives, shrouded in black, carried vegetables and articles homeward. Down the street came a new bicycle pedaled by an army officer whose small son sat proudly on the handlebars. Donkeys, carts, and porters moved about delivering bundles and packages.

The next parallel street contained the refurbished and modernized Grand Hotel and the larger stores and shops. At one counter where post cards, tobacco, and knick-knacks might be obtained, sat the well-dressed, well-built, dark-complexioned owner. The purchase completed, the change made, the man started to speak in an American variety of broken English. His two brown-eyed sons of some eight and ten years of age looked at their father in wonder at hearing him speak in a strange tongue. He went on to tell of his war experiences in the Serbian Army in 1914, the escape to Siberia, the eventual arrival in the United States and the ten years of work in the Anaconda copper mines in Montana, and the return to a free and independent Jugoslavia. He explained that the savings he had accumulated in America were worth five times more in his homeland. Thus he had been able to set up a shop and rise to a place of

* The familiar names of the provinces of Montenegro, Herzegovina, Dalmatia and many others no longer designate the political divisions of banats into which Jugoslavia had been reorganized in 1930.

Other place names:

Jugoslav	*Italian*
Dubrovnik	Ragusa
Kotor	Cattaro
Shkodra	Scutari

some importance in the community. From the door of his shop could be seen the simple former palace, a box-like house of two stories. Across the road was the small frame house in which the late King Alexander was born.

Shortly before two o'clock, the bus driver began to toot the horn demandingly for those passengers who had strayed. With fanfare and flourish, the bus rattled over the dusty cobblestones. The route lay toward the southwest. A few scattered trees lined the highway. Soon the town was left behind. The small patches of corn and grain that appeared no larger than a rug were lost from view in the maze of stones and rough pasture.

THE BLEAK INTERIOR

A few misshapen scraggly oaks struggled on the bare hills. The new view opened into land that might well have been called "Hell's Half Acre" or perhaps "Devil's Gardens," titles which are somewhat inaccurate since there are thousands of acres of this type of forgotten land in Jugoslavia.

The bus snaked along the only road opening into the main valley toward Lake Shkodra. Beyond to the south and east were the mountains of Albania. On the highest cliff above the road on the other side of the valley stood the crumbling walls of an ancient Turkish fort whose lookout commanded a view of the pass, the lake, and the sea to the west. Reaching the lake, the bus followed the road high above the water's edge for a short distance and then began the gradual descent to sea level by means of a few more switchbacks. To the west the Adriatic Sea was visible. Gradually, cypress, olive, vine, and palm flanked the highway. The walled promontory on which Budva stands came into view. The bus was following the road along the seashore passing the homes of gardeners and fishermen whose nets were hung to dry along the beach. It was three o'clock.

BUDVA

Budva, one of the oldest towns along the coast, has also known a succession of conquerors. It was a settlement before the Roman Era and in time fell to the Turks whose walls and towers still encompass the town plaza and shopping center. Legends tell that tribute was never paid to either Venetians or Turks by the citizens of Budva.

The bus came to a stop under the shade of the liveoak, palm, and eucalyptus trees that lined the road by the gateway. The more

recently built stores and homes extended for several blocks about the old town site. In the shops, handwork, fruits, wines, and sea food were plentiful. The resort business, too, seemed to be flourishing. In fact, the entire Adriatic Coast appeared to be unusually popular with German tourists.

The Return Trip

From Budva, the bus passed quickly by irrigated and terraced fields and soon resumed the climb up the switchbacks to recross the Coast Ranges whose elevations of 3,000 and 4,000 feet began to cast long shadows on the bays along the shoreline. Eventually, the route from the southwest joined the lower portion of the Lovčen Serpentine (Fig. 1). On the descent into Kotor, the bus retraced a part of the morning's journey.

Leaving Kotor, the bus turned to the left, traveled along the shore of the bay for a short distance, then cut across the peninsula. Villages, straggling settlements, and another barracks were along the route. Occasionally some of the very villages thru which the bus had passed in the morning were visible from across the bay. The sun was near the horizon when the bus arrived at Roze. Here it was driven upon a float of two large rowboats lashed together with a plank platform. A gas engine supplied the power to propel the raft across the inlet. Once across, the bus resumed the original road south of Herzegnovi. From now on, the bus stops at towns and crossroads were very brief and the passengers less voluble. The cool sea breezes set in as dusk shut off the view of the countryside.

The lights of Dubrovnik blinked a welcome to the returning bus. Music from cafes and hotels could be heard as the bus coasted thru the old gate, down the hill along the city walls, and came to a convulsive stop at the station.

Conclusion

In this small sample area of eastern shore Adriatic and its immediate hinterland, the several characteristics of the Mediterranean region occurred in close proximity. Here were the vine and olive, the mountains frowning at the coast, and the dry stony interior plateaus suitable for sheep and goats. In spite of imposed cultures and influences of the past thousand years, clan and tribal loyalty shared first place with a kind of fierce pride in the nationalism of Jugoslavia.

GEOGRAPHY FOR THE JUNIOR COLLEGES*

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"We are more illiterate geographically than any civilized nation I know," was the opinion expressed by Dr. John W. Studebaker at the meeting of college and university presidents in Baltimore at the opening of this year.[1] We find this opinion echoed by editorial writers of journals that cannot be classed as professional publications.[2]

News writers, radio commentators, soapbox orators, and cracker-barrel philosophers are aware of the geographical significance of sudden military thrusts or contemplated military strategy. The oil of Burma, the oil of the Caucasus, the wheatfields of the Ukraine, the dagger whose point is Vladivostok aimed at the heart of Japan, the rubber of Malaya, the iron ore of Sweden—these are at once pointed out as significant in the schemes behind the maneuvering of armies.

The social scientists and, particularly, the teachers of social studies are perhaps less aware of the geographical implications of the present global war than are other educational leaders. The National Commissioner of Education makes a definite recommendation when he says:

> I would recommend that in some way thruout the secondary schools and in the colleges and universities a real emphasis now be laid upon acquainting the American citizen with the realities of the world thru intensive courses in world geography. It is in these later years of the educational scheme that the students have achieved the maturity necessary to an understanding of this important subject.[3]

The eleven "educational priorities" listed by the Educational Policies Commission in its "A War Policy for the Schools" includes, by implication, geographical knowledge.[4] It states:

* This paper was read on April 10, 1942, before the Minnesota Junior College Deans Association meeting at the University of Minnesota.

[1] John W. Studebaker, "The United States Office of Education and the War," *Higher Education and the War,* American Council on Education Studies, Series I, No. 16, Washington, D.C., February, 1942, p. 56.

[2] Eugene Lyons, "The State of the Union," *The American Mercury,* Vol. LIV, No. 220 (April, 1942), p. 461 ff.

[3] Studebaker, *op. cit., loc. cit.*

[4] "Teaching the Issues, Aims, and Progress of the War and the Peace." Quoted in *Social Education,* Vol. VI, No. 4 (April, 1942), p. 153.

We should teach the interdependence of the United States, Great Britain, the British Commonwealth, the Chinese Republic, Russia, and the associated powers, and the need for full cooperation among them in waging the war. The interdependence of the republics of the Western Hemisphere should be stressed, together with the need for mutual understanding and mutual support among these countries, not only during the war but afterward.[5]

And:

Finally, let us teach that the United States is now inseparably bound up in world affairs and that it must never again attempt to retreat to a position of isolation.[6]

AIMS

Certainly one of the aims of the teaching of geography must be to give an understanding of the interdependence of nations and peoples. The influence and meaning of soil and topography, of climate and natural resources in the lives of the peoples of a given region which in turn influence work relationships, not merely in a political but particularly in a social and economic way, these must be some of the aims of teaching geography especially on the junior college level.[7]

The program of social science instruction would give knowledge and understanding concerning the earth as the physical home of man, the relation of geographic factors to the evolution of human culture, the distribution of natural resources over the globe, the struggle of individuals, groups, and nations for possession of lands, mines, and forest, and concerning the whole question of the rational use of material endowment of the country in the planning of the economy and in the general enrichment of the common life.[8]

A mere accumulated knowledge of geographical facts will not be enough for the students. If by "the ability to think geographically"[9] we mean a realization and a functional appreciation of the

[5] *Ibid.*, quoted from p. 20.

[6] *Ibid.*, quoted from p. 22.

[7] Edith V. Brill, "What Method Shall We Use in Teaching Geography?" in *Geography: How to Teach It,* edited by George J. Miller, Geographic Education Series, Vol. I, Bloomington, Illinois, McKnight and McKnight, p. 28, speaking of geography in the elementary grades, remarks: "Geography is the strategic subject connecting natural environment with man's activities. Its study should enable pupils to interpret all people and their lives in terms of their environment and to recognize the contribution of all to the welfare of all. This must lead to an understanding of what world interdependence means and to a realization that the study of geography is as comprehensive as life itself."

[8] *Conclusions and Recommendations of the Commission,* Report of the Commission on the Social Studies, American Historical Association, Charles Scribner's Sons, 1934, p. 50. Cf. also p. 166 for Dr. Isaiah Bowman's reservations.

[9] Harlan H. Barrows, "Some Critical Problems in Teaching Elementary Geography," in *Geography: How to Teach It,* edited by George J. Miller, p. 1, says: "The chief

"seamless web" of society, world-wide in its extent,[10] then we have arrived at an all-important objective of the teaching of geography, whether on the elementary or on the secondary level.[11]

These aims, properly carried out, will assure the desired outcomes of the teaching of geography. There will be, of course, a teaching of geographical facts—of rain-fall, the fertility of the soil, the extent of mineral deposits, the location of oil fields, harbor facilities, river navigation, etc. The interrelationships, conditioned by geographical factors, will be learned. Students will learn—it is hoped—that their activities cannot be divorced from the activities of other peoples any more than the activities of other peoples can be thought of as having no bearing on their own lives and fortunes. "The road to Mandalay" will mean more than a favorite rendition of *basso profundo* aspirants, and Murmansk will be more than something that "sounds like the name of a Russian town." A study of the economic geography of Argentina will, e.g., give the student a better understanding of relationships between the nations of the New World and the relationship between this country and the Old World.[12]

I am aware of the fact that in my statements regarding aims and outcomes I have said nothing about certain skills which the study of geography obviously ought to develop, e.g., the ability to read a map, topographical, political, or whatever kind of map it may be. Nor have I included the teaching of conservation in this subject. I would not omit this important topic nor exclude it from a course in geography on the junior college level. If I may refer again to the eleven "educational priorities" mentioned before I would cite the "priority" which reads "Conserving materials by prudent consumption and salvage," and another which stresses "Promoting

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end in teaching geography is not information, but ability to think geographically. The outstanding objective of geography, in other words, is to help make purposeful thinkers and successful doers, not to create animated gazeteers."

[10] Charles A. Beard, *Charter for the Social Sciences in the Schools,* New York, Charles Scribner's Sons, 1932, has popularized the phrase "the seamless web," which has also been adopted by A. C. Krey, *A Regional Program for the Social Studies,* New York, the Macmillan Co., 1938, especially p. 4.

[11] *Ibid.,* p. 104, stresses that "the true goal of teaching in the social studies" is "an understanding of society."

[12] George J. Miller (editor), *op. cit.,* contains some interesting unit studies for the elementary grades, e.g., Lenox B. Chase, "A Study of How to Teach the Economic Geography of Argentina," pp. 135-140; Marie McLaughlin, "Study Guide for the Nitrate Regions of Chile," pp. 141-150; Marion O. Little, "The Teaching of Rubber," pp. 185-188.

health and physical fitness.''[13] Has geography anything to do with such objectives? In answer let me quote at length from Dr. Isaiah Bowman, President of Johns Hopkins University and one of the foremost geographers of our country:

In the progressive and often destructive use of natural resources there is an ever finer adjustment of society to the regional diversities of the earth. Geography has no more important role than that of interpreter, to government and society, of data that bear upon the duration of natural resources and their best present use in view of future needs, not the remote future, for we are not wise enough to see far ahead, but the future in which our children will be blessed or cursed by our acts. What we have in mind is not the negative doctrines of extremists and sentimentalists who would shut us off from almost any use whatever, but the positive doctrine of rational use free from needless waste. . . .

Countless communities thruout the United States have wasted their soils, their timber, their waters with evil and locally disastrous effects upon the standard of living, upon education, upon community life. The index of civilization has dropped. In such places citizenship is an affair of material remnants and no longer a matter of spirit also. Surely there is no question of the need for attention to conservation policies. Such policies are or should be the principal concern of the geographer because they affect the regional adaptation of life to the earth and of earth to life. The facts of geography reach in a multitude of ways into the practical affairs of men—soil types and crop zones, the differentiation of products and techniques of cultivation, the special modes of living in the more highly co-operative societies of marginal regions, the geographical setting in relation to the possibilities of city development having in view the "many-sided personalities" of those we hope to see dwelling therein: no catalog this, only a crossroads indication at a given point in the journey.[14]

WHAT TO TEACH

In view of all this, what shall be the material which shall be taught? We are not thinking of making trained geographers nor skilled map-makers. We are not concerned primarily with those who would specialize in the study of geography either for research purposes or for teaching. We *are* concerned with those in the junior colleges who will terminate their formal education on that level or those who will terminate their formal training in the social studies. What materials shall be taught them?

We cannot very well follow the specialized courses which are offered in the colleges and universities of the country. Some of the fundamental courses which are offered, let us say in the teachers colleges, might provide us with some guidance. In these courses the ''language'' of geography is studied, the knowledge of technical terms, the elements, and human ecology, ''the fundamental prin-

[13] *Social Education*, Vol. VI, No. 4 (April, 1942), p. 153.

[14] Isaiah Bowman, *Geography in Relation to the Social Sciences*, New York, Charles Scribner's Sons, 1934, p. 97.

ciples of human adjustments." We might look to some of the other courses taught there, courses in regional geography which emphasize "man's efforts to utilize the natural assets of a region so as to attain maximum returns to himself and to society." Or we might think of a course which gives special consideration to the "significance of geographic and economic elements in national and international problems," or one which stresses "the significance of food, minerals, and other national resources in national prosperity and international relations."[15] All such courses would be too limited, I believe, for the junior college. We might look to the example of European schools, where geography is taught not only on the elementary level but on all levels. Of the European schools we learn:

> . . . in the secondary school, there is always a careful regional study of the home land, preceded or followed by extensive studies of areas of major and minor importance, usually closing with a study of the relations of the rest of the world to the home land.[16]

But while we may learn much from Europe regarding the teaching of geography we cannot take, let us say, one of the courses of study on the secondary level in England or Sweden and transfer that bodily into our junior colleges. For one thing those courses are built up on a systematic course of study in which geography is taught two periods a week in every grade on the secondary school level. How many of our junior college students have had courses in geography since they left the seventh or eighth grade? Perhaps one of the educational changes we will see resulting from the present war—and you and I are certain that there will be changes also in the educational world, tho we may not be able to predict their exact nature—will be the introduction of geography for all high school pupils in order to overcome the "geographical illiteracy" and the "psychological isolation" made evident by the bombing of Pearl Harbor and its sequence.[17] Such projections into the future will not help us solve our present problem, however, and we have not yet answered the question, "What materials shall be taught?"

I am not prepared to lay down any definite scheme or body of content for a junior college course to meet the stated need. I be-

[15] *School Progress*, Catalog Number, published by the Mankato State Teachers College, Mankato, Minn., Vol. XXII, No. 2 (February, 1941), pp. 84-86. This school has been chosen as an example because of its strong department in geography.

[16] Rose B. Clark, "Geography in the Schools of Europe," in Bowman, *op. cit.*, p. 292. Cf. *passim*, pp. 228-366.

[17] These phrases are quoted from Eugene Lyons, *op. cit., loc. cit.*

lieve that such a course should be elastic. It should be conditioned by the students' knowledge or ignorance of the subject in general; it should meet their individual needs and interests; it should conform in general, to the aims and objectives set up. More specific and detailed than that I cannot be. I might suggest that an exploration will reveal—I fear—a dismal ignorance of the geography of their own country, the territories and possessions of this country, together with the natural resources, etc., thereof. There will be, I am almost certain, only a very hazy knowledge of our neighbors to the South and of the Far East. Europe will be—am I saying too much?—literally *terra incognita,* at least to many. In other words, I fear that such an exploration will reveal that Dr. Studebaker made an understatement when he said: "We have never really taught geography."[18]

You will say that my proposals will lay a heavy burden upon the teachers of such courses and that they will never be able to really teach geography in the semester or the two semesters given them in the junior college. I grant that this may be true. They can make only a beginning; they will be forced to make selections from the vast fund of geographical knowledge. Certainly, however, they ought to be able to teach junior college students how to think geographically, to take a scientific viewpoint of the subject, and to gain some appreciation of international relationships.[19]

TEACHERS

Where will you find teachers for this course? I don't know. There aren't enough trained specialists to supply the junior colleges with specialists in geography, particularly if only one course in geography is offered each year. It may be possible in some instances to dip down into the junior high school field and come up with a good geography teacher. In general, however, you will have to turn to your social science teachers (already burdened with a diversity of subjects) and ask them to prepare themselves by summer school work for such courses. I might add that they will have to prepare not only themselves but also their courses during that time. Incidentally, it might do them some good, too, but how much is a question. In general, I believe, you will be able

[18] Studebaker, *op. cit., loc. cit.*

[19] Bowman, *op. cit., passim.* See particularly his "Conclusions," pp. 216-227. Cf. also *Conclusions and Recommendations, passim.* Vide supra n. 8.

to find an alert teacher in the field of economics or history who will rise to the challenge.

This raises the question of integrating or fusing geography with the courses already offered in history or economics. Both in history and economics the question "Where?" must be answered. In the words of Henry Johnson, "History without geography and geography without history are alike unthinkable."[20] But we must also concur in the sober judgment of this great scholar:

> In general, specialists both in Europe and the United States have agreed, and still seem to agree, that the place to teach the geography needed to illuminate history is in the history class, and the place to teach the history needed to illuminate geography is in the geography class. . . .[21]
>
> There are, beyond question, points of natural contact between separate subjects which should be foreseen in planning the curriculum, and consciously turned to account by all teachers. But in the absence of a higher integration it is at best a doubtful procedure so to manipulate any subject as to impair or destroy the integrity of its own peculiar contribution.[22]

It is the "peculiar contribution" of geography that we wish to bring to our junior college students; let us teach them geography to attain that end and not add, by means of fusion, confusion to their geographical illiteracy.

[20] Henry Johnson, *Teaching of History in Elementary and Secondary Schools with Applications to Allied Studies,* revised edition, New York, The Macmillan Co., 1940, p. 348.

[21] *Ibid.,* p. 349.

[22] *Ibid.,* p. 361. Cf. the whole chapter, ch. xvii, pp. 346-361, "Correlation, Fusion, and Integration."

AERONAUTICS AND GEOGRAPHY*

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INTRODUCTION

The only thing that is permanent is change. Time brings many changes.

Today we are at war again. War is a miserable thing. It upsets commerce, industry, business, schools and nervous systems. But at the same time it causes intense concentration especially in the fields of science, mathematics and mass production. Such concentration today in the United States is being applied as never before to aeronautics, and the progress that is being made in this field is almost unbelievable. Well-trained pilots are learning to fly modern aircraft with increased skill; navigators make use of many instruments in keeping the ship on its course; and manufacturers, with the help of engineers and mathematicians, are producing planes that already have reached a speed of 500 miles per hour and that in the near future may reach 700 or more.

It is predicted that the close of the war will bring an increase and not a decrease in the development of aviation. In all probability a large international air force will be employed in an effort to maintain world peace. Commercially, aircraft will be used in many ways. The largest planes will carry mainly freight and express. Smaller and faster ships will carry mail and passengers. Most first-class mail may be carried by aircraft equipped to drop and pick up mail at small towns without stopping. Non-stop flights from California to New York will be very common. Even today airplanes are crossing the North Atlantic Ocean in less than ten hours.

Therefore it is most urgent that our school systems give attention to this modern, swift method of transportation.[1] On numerous occasions the public schools of a democracy have been criticized for being slow and inefficient in their efforts, if any, to cooperate in the development of the new things in science and industry. It is to be hoped that this condition in our schools may be corrected.

* Abstract of an address given before the geography section of the N.E.A. at annual convention in Denver, Colorado, July, 1942.

[1] The reader is referred to an article on aviation by the writer in the JOURNAL OF GEOGRAPHY for December, 1930.

AERONAUTICS COURSES

During the present school year, hundreds of American high schools are offering for the first time a full year course in aeronautics, a course that will be considered a laboratory physical science similar to physiography, physics or chemistry. This new subject demands that teachers have considerable technical training. Many teachers have taken summer school courses in aeronautics at various universities in an effort to acquire such training. Some skeptics are saying the aeronautics course will remain in the curriculum only for the duration of the war. Perhaps it may drop out of some schools, but it will remain in many for years to come.

An erroneous conception of the course is that all who take it will ultimately become pilots. Such is not the case. The course is a general one, so that the young student becomes acquainted with many lines of work in any one of which he might specialize, and all of which are related to the general field of aviation. Among these may be mentioned meteorology, map making, navigation, aerial photography, radio, aerodynamics, engine mechanics, airplane construction and repair, precision instrument upkeep and repair, airport manager, air control administrator, dispatcher, etc.

Experience in aviation schools compels the writer to emphasize the fact that physiography, physics, algebra and geometry should be considered as prerequisites for those intending to take the course in aeronautics.

IMPORTANCE OF PHYSIOGRAPHY

Of the various subdivisions of geography, that which has the greatest possibilities for practical application to aeronautics is physiography, or physical geography, or, as it is called in New York State, "earth science." The term "physiography" is used here in its broadest meaning, and includes study of the atmosphere, lithosphere and hydrosphere. Let us consider some of the ways in which this science is of real practical value to a person interested in aviation.

1. **Place Geography.** Since aviation implies traveling over great distances at great speeds, it follows that pilots, navigators and radio operators should familiarize themselves with the location of many important places on the earth's surface. Of several important items sadly neglected in American secondary schools, place geography probably ranks at the top.

2. **The Earth in Space.** The student of aeronautics should know something about the earth's position in the solar system, the motions of the earth itself, and the phases of the moon. Such knowledge is fundamental to the study of meteorology and navigation. Of equal importance is an understanding of longitude and latitude, by means of which quick calculations of distance can be made. For example, St. Joseph, Mo., 95°W., and Denver, 105°W., are about 40°N. Estimate quickly the distance between them. Since at 40°N. one degree of longitude is about 53 miles, we have 105° minus 95° equals 10 degrees, which, multiplied by 53 gives 530 miles.

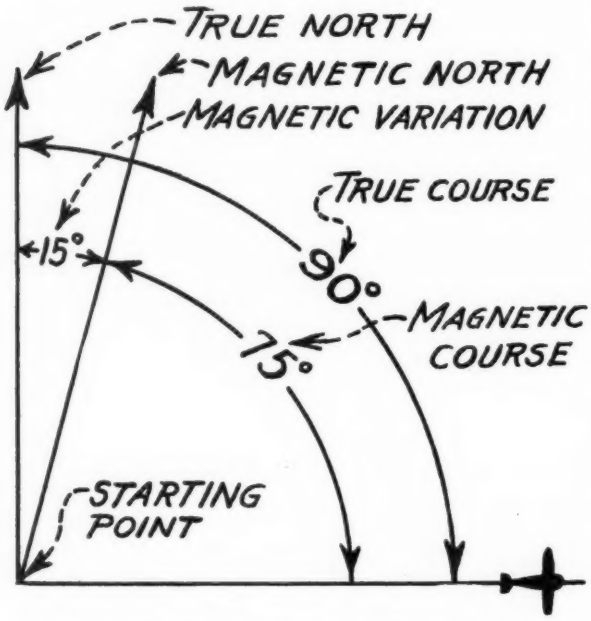

FIG. 1. In California the variation (15°E.) is subtracted from the true course (90°) giving a magnetic course of 75°.

Longitude is used to calculate time. Fifteen degrees of longitude equal one hour of time. When it is noon in St. Louis, 90°W., what is the time at Greenwich, England? Six hours later, or 6 P.M.

3. **Great Circle Routes.** The easiest way to calculate the airline distance from San Francisco, California, to Yokohama, Japan, is to stretch a string tightly on a globe between the two cities. Transfer the string to the equator, note the number of equatorial degrees, and multiply by 69 miles per degree. The path of the string over the globe shows the shortest flying route or Great Circle route between the two cities.[2] The student will immediately notice that the Great Circle curves northward, almost reaching the Aleutian Islands.

[2] See *Laboratory Exercises in Physical Geography* by M. H. Shearer, McGraw-Hill Book Co., Inc., New York, 1941.

4. **Calculating the Magnetic Course.** Magnetic variation is the angle between true north and magnetic north. True north may be determined by using the shadow of a plumb line at noon, sun time. Magnetic north is indicated by a magnetic compass. Places of equal magnetic variation are connected by isogonic lines. The agonic line is the line of no variation.

Problem: We wish to fly due east from a point in California where the variation is 15° east. What will be the magnetic course? Answer 75°. (See Fig. 1.)

Problem: What will be the magnetic course at take-off when flying due east from Boston where variation is 15°W.? Answer 105°. (See Fig. 2.)

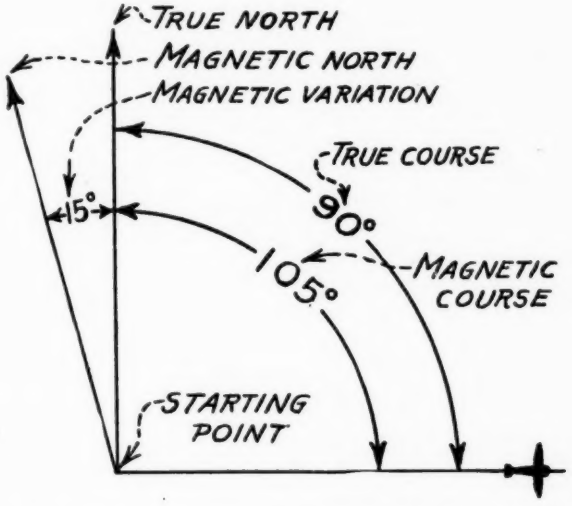

FIG. 2. In Boston the variation (15°W.) is added to the true course (90°) giving a magnetic course of 105°.

5. **Maps and Map Projections.** The pilot and navigator especially should have some konwledge of map projections.[3] Excellent navigation maps, published by the U. S. Department of Commerce, cost about 40 cents each. They show surface relief of the land by colors, isogonic lines, civil airways, radio stations and their directional beams, compass rose, longitude and latitude, etc. The science of navigation is no longer limited to the ocean. Airplanes fly over land as well as over sea and in three dimensions.

6. **Meteorology.** Pilots and navigators are required to study meteorology. The pilot must pass a government examination in this subject. A modern full-year course in physiography should devote perhaps an entire semester to the study of meteorology and cli-

[3] A simplified treatment of this subject may be found in Pages 596-603, *The Earth and its Resources* by Finch, Trewartha and Shearer, McGraw-Hill Book Co., Inc., New York, 1941.

mate.[4] The tremendous importance of meteorology in connection with aeronautics cannot be overemphasized.

Consider for a moment only one characteristic of the air, density. As altitude increases, density of the air decreases about 2% per 1000 feet. This decrease is largely responsible for the 3% decrease per 1000 feet in the horsepower of an airplane engine. Wind drag (resistance) on the wing, however, at the same angle of attack, does not change with higher altitude since the increased speed at higher altitude counterbalances the decrease in air density. The rate of climb of the airplane in feet per minute decreases as altitude increases.

The study of meteorology, as a major part of the general physiography course, is probably the outstanding contribution of this science to aeronautics.

7. **Physical Relief of the Continents.** By studying contour and other types of relief maps, the prospective pilot becomes familiar with the general relief of the land over which a given air route may pass. In actual commercial flying, the pilot or co-pilot often is required to inform passengers of interesting relief features of the earth that may be seen from the air. Contour maps are especially valuable in showing more exact elevation of the land above sea level, which has much to do with the speed at which a plane lands. Pilots who fly cross-country soon learn that the landing speed of a plane is much greater at high elevations than at sea level. This being the case, it is necessary therefore that airports located at high elevations have unusually long runways.

8. **Pilot Charts of the Oceans.** The study of oceans as provided in the physiography course would be incomplete without the use of the excellent pilot charts of the various oceans. These may be purchased from the U. S. Hydrographic Office, Washington, D.C., at a cost of about ten cents each. For laboratory work in physiography they are most satisfactory. Longitude and latitude, wind belts, average wind velocities and directions, isogonic lines, storm tracks, fog areas, Great Circle routes, compass rose, radio stations, fueling stations, seaports, etc., are clearly shown. A knowledge of all these is of much value to the pilot or navigator.

9. **Raw Materials used in Airplane and Engine Construction.** In the study of the lithosphere, the physiography student learns

[4] For high school and beginning college classes, see *Elementary Meteorology* by Finch, Trewartha, Shearer and Caudle, McGraw-Hill Book Co., Inc., New York, 1942.

to identify the more common rocks and minerals. Of greater importance, however, is the acquiring of some knowledge of the distribution and uses of the more important minerals. In the construction and operation of the airplane and its engine, certain mineral resources are of first importance. Among these may be mentioned petroleum, iron, aluminum, copper, lead and zinc. Modern metallurgy involves increasing use of such alloy metals as nickel, chromium, manganese, tungsten, molybdenum and others.

CONCLUSION

Perhaps, when the present war is ended, we shall enter what may be known as the "air age." In preparation for this "air age," our schools should cooperate to the fullest extent. As a preparatory, fundamental course for the prospective student of aeronautics, physiography or physical geography takes first rank along with mathematics and physics.

TRACING THE FOOTSTEPS OF AUTUMN: AN EDUCATIONAL EXPERIMENT*

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In the summer of 1941 an educational project was started in a small way under the direction of Dr. Alice Foster, the project extending across several states which were selected in order to give a north-south traverse of the country. Judgment as to whether it would be worth continuing and expanding was reserved until a later date. The following is a report on the character of the project and progress of the experiment.

The general purpose of the project is to find out how and when autumn changes the landscape in different localities, to the end that we may learn how autumn travels across the country from north to south in the later months of the year.

The project seeks to strengthen the student's geographical ability to observe phenomena in his landscape and to record them in some sort of calendar or time sequence arrangement. Incident to this work, the student's feeling of intimacy between himself and his community is strengthened, and by making the work of students available to all, the project seeks to help each participating class see its place in and relation to the autumn changes across the whole country. The work may contribute to the student's appreciation of the fact that his own community is a portion of the total community and show him that in his own neighborhood he finds representation or variation of the geographical principles he meets in his studies of other areas. The project seeks to contribute to the growth of geographic education in the country thru its stimulus to student and teacher interest in simple geographic techniques and to further the National Council's efforts to increase the quality and quantity of geographic education as well as to serve as a clearing house of information.

The ultimate aim, if the project is continued, will be to get *concrete* data to give flesh and blood to the skeleton knowledge we already have about the length of growing season in different latitudes and to make these latitudinal differences more concrete for teaching purposes than they now are. This would, of course, require

* Presented at the New York Meeting of the National Council of Geography Teachers, December, 1941.

continuation of the project for a period of years and its expansion to many additional stations.

A list of items to be recorded was made out and a copy was sent

AUTUMN IN YOUR LOCALITY

Station _____, Illinois

RECORD BY WEEKS	SEPTEMBER				OCTOBER				
	1–7	8–14	15–21	22–28	29–5	6–12	13–19	20–26	27–2
Slight autumn color in leaves									
Much autumn color in trees									
Many leaves falling									
Elm trees bare									
Oak trees bare									
Blackbirds in flocks									
Geese flying south									
Light frost									
Ice on bird bath or trough									
Fall plowing in fields									
Farmers filling silos									
Soybean leaves dropping									
Farmers harvesting soybeans									
Harvesting corn									
Harvesting potatoes									
Harvesting other root crops									
Cutting sorghum									
Harvesting winter apples									
Planting wheat									
Taking down window screens									

_____, Teacher

_____, Student Secretary

to a member of a teachers college geography department in each of several states with the request that he furnish a list of six or eight teachers who might be willing to participate in the project. It was suggested that the teachers be sufficiently scattered to give

a latitudinal spread in the state. The letter stated the additional request that he revise the list of phenomena to make it fit conditions in that state. The revised list was put into the form of a table. Copies of the table were later mailed to several teachers in each state, together with a letter to the teacher and a second letter to the class soliciting their participation and explaining the project.

The items indicating the approach of autumn and winter fall, for the most part, into four groups: agricultural activities; changes in natural vegetation; changes in weather; changes in faunal life.

Response to Dr. Foster's request brought data from a number of observing stations. The latitudinal spread was from Superior, Wisconsin, to Irondale, Alabama, a suburb of Birmingham. The reports do not furnish sufficient data to give anything but a tentative sketch of the footsteps of autumn. They serve better to hint at what might be done were the number of observing stations increased and the items to be observed at each station made more uniform and comparable.

The data allow certain general tentative statements to be made. The following serve as illustrations:

1. Leaves had stopped falling in the northern half of Wisconsin by about the middle of October. In Illinois they had started to fall in late September and continued until the end of the observation period (Nov. 2). In Alabama, they did not begin to fall in great numbers until well into October—at about the time the phenomenon was over in Wisconsin.

2. Trees were reported bare in Superior, Wisconsin, the third week in October, but not until the fourth week at St. Croix Falls and Plymouth. Neither Galesburg nor Jacksonville, Illinois, reports bare trees by the end of the period of observation, and, as stated before, the leaves in Alabama were only beginning to fall near the end of the period of observation and so no bare trees were reported.

3. Wisconsin stations reported white frost during the last few days of September. The first frost in Illionis was reported for the same time. This is probably the result of a general cold spell and was not reported again at the Illinois stations until about the middle of October. The two northern stations of Alabama report white frost during the last week of October. None was reported at Irondale, Alabama, during the period of observation.

The experiment seems to indicate that students *are* interested in making their observations and in working for such a project. One letter received read as follows:

Douglas School
Galesburg, Illinois
November 2, 1941

Dear Miss Foster:

We have enjoyed looking at and recording the signs of approaching autumn. The chart has been filled out to the best of our ability. We are now more aware of changes about us.

Your friends,
The Fourth Grade

One teacher wrote that her freshman and sophomore classes in high school enjoyed keeping the record, that a check-sheet was made for each pupil which he kept in his geography notebook, and that new developments were reported daily and each Monday morning everyone was ready to take the record. Those particular classes made a long and interesting list of evidences of coming autumn other than those on the original record sheet. The list includes such items as: squirrels storing food; people putting away their lawn mowers; Farm Bureau stated on September 26 that "It is time to plant winter wheat because the Hessian fly danger period is over."

I feel that the project is worthy of further experimentation and I think that not only will it provide valuable data which is not now available on just what is meant by length of growing season but also the response of teachers and students to this preliminary effort assures us that the project stimulates students in their thinking about signficant changes in their own environment.

The response seems also to indicate that it is effective publicity for the National Council and the general cause of geography.

If the project is continued and expanded, it should include observation of phenomena of winter and spring as well as autumn. The list of items to be observed needs attention and revision. It is difficult to plan a list so as to include in their right proportion the items which are satisfactory for consideration by the students and intriguing to them, which will keep interest alive thruout the observation period, which fit the particular conditions of the various states, which serve as a basis for comparison between states, and which are significant indexes of the changes of the seasons.

EDITORIAL NOTES AND NEWS

Word has reached us that the following geographers have entered war service. For other lists see the JOURNAL for December, 1941, March, 1942, and May, 1942.

Army Map Service
Edward Espenshade (University of Chicago)
Floyd Matsen (University of Chicago)
Eugene Mather (University of Wisconsin)
Elizabeth Day (University of Illinois)
Mary Renard (Ohio State)
Norton Ginsberg (University of Chicago)
Alden Cutshall (University of Illinois)

Department of State
John Alexander (University of Wisconsin)
Chauncy D. Harris (University of Nebraska)

Board of Economic Warfare
Shannon McCune (Ohio State)

U. S. Army Intelligence G2
Joseph Van Riper (Southern Illinois Normal University)

U. S. Navy Air Corps (Meteorology instructor)
Norman Carls (Eastern Illinois State Teachers College)

The April issue of *School Arts* featuring Pan American Art is an innovation in that it is bilingual.

The spring meeting of the Ohio Council of Geography Teachers held at Oberlin College featured the following program: China and Japan, by Oscar Thomsen, Oberlin, Ohio; Uniting the American Republics, by F. Webster McBryde; Development of a Geographic Museum, by James R. Beck, Kent State University; and Geopolitics: A New Design for the World, by Guy-Harold Smith, Ohio State University.

DR. JOHN GARLAND, Western Reserve University, gave the luncheon address at the spring meeting of the Northeastern Ohio Council of Geography Teachers at Lakewood, Ohio. Dr. Garland replaced Dr. Shannon McCune whose name was on the original program submitted to the JOURNAL Staff which appeared in the May issue of the JOURNAL.

ADELBERT K. BOTTS, State Director, New Jersey Council of Geography Teachers, Trenton, New Jersey, announces that the next scheduled meeting of the Council will be held in the Hotel Marlborough-Blenheim, Atlantic City, November 6, at 2:30 P.M., in conjunction with the New Jersey Education Association. The Council is encouraging interest in geography by awarding a year's free membership in the State Council to New Jersey College graduates having majors in geography.

Not long ago, Congress passed a bill providing $20,000,000 for the completion of the Inter-American Highway from Mexico to the Panama Canal. One can now drive in comfort as far as eighty miles south of Mexico City. Sixty-two per cent of the remainder of the highway is paved but not in a continuous stretch. Each Central American country has some paved roads, but only two capitals, Guatemala City and San Salvador, are linked with pavement. The Panama portion of the highway is fifty miles from the Costa Rican border.

The Northeastern Ohio Council of Geography Teachers held its spring meeting at the Hayes School, Lakewood, Ohio, on March 7. The morning session was devoted to field and laboratory studies with a demonstration with 5A class by Miss Lucille Kenney of Lakewood, and a panel discussion led by Miss Edna Eisen of Kent State University. Dr. Shannon McCune of Ohio State University gave the luncheon address on Northeastern Korea and adjacent areas of Manchuria and the Soviet Union. A field trip thru the Rocky River Valley and greenhouse section was conducted by Miss Villa B. Smith of Cleveland. The program chairman was Mrs. Adelaide Blough.

Grand Coulee Dam's first giant hpdroelectric generator began supplying electricity for commercial use more than a year ago. A second unit was put in service in January, 1942. In a year's time their dynamos delivered more than 400,000,000 Kilowatt hours of energy to industrial plants in the Pacific Northwest. Another generator with a capacity of 108,000 Kilowatts will be serving our defense plants this spring, according to a release from the Bureau of Reclamation, United States Department of the Interior.

The Alabama Council of Geography Teachers met in Birmingham, March 27, in connection with the Alabama Education Association. Dr. J. Sullivan Gibson, State Teachers College, Livingston, reported on the annual meeting of the National Council of Geography Teachers. E. W. Branyon, Superintendent of Education, Marion County, spoke on "Some Geographic Problems of the World War," and Dr. J. Allen Tower, Birmingham-Southern College, discussed "Population and Land Use Changes in Alabama."

The National Council for the Social Studies and the National Association of Secondary-School Principals announce the preparation of a series of 26 Resource Units to be issued serially, under the title, "Problems in American Life." The first five of the series were to be released in April. Their themes dealt with government finances, the future responsibilities and opportunities of youth, man and his machines, recreation and morale, race and cultural relations. The price is nominal. The units may be secured from the National Council for the Social Studies, 1201 Sixteenth St. N.W., Washington, D.C.

The *Illinois Bulletin of Geography* for December, 1941, featured an address by Dr. Alice Foster on the Interrelationships between National and State Councils of Geography Teachers which was given by Miss Foster at the Illinois State Council Meeting at Urbana, November 7, 1941. Copies of the Bulletin are available from the editor, Dr. W. O. Blanchard, University of Illinois.

According to recent press reports, the soil and climatic requirements of the American tung tree confine it to a narrow strip of land along the southern borders of Mississippi, Alabama, Georgia, Louisiana, Texas, and the western and northwestern coast of Florida. The largest tung tree plantings are in Pearl River County. One development has 35,000 acres. Plantings in all six states mentioned above total about 175,000 acres. The Department of Commerce estimates that a million acres are needed to supply our needs. In 1937, the United States imported 175,000,000 pounds; in 1938, 110,000,000 pounds; and in 1940, roughly 100,000,000 pounds. Domestic production in 1940 yielded about 5,000,000 pounds, the peak production to date. The first tung trees were planted here about thirty-five years ago. One of the original sixteen trees planted can be seen at Biloxi, Mississippi, producing annually its crop of nuts, the oil of which is so vital for its quick-drying and water-proofing qualites. Three out of the seven oil-extracting plants are in Mississippi.

GEOGRAPHICAL PUBLICATIONS

Henry B. Ward, Editor. **The Foundations of Conservation Education.** 242 pp. National Wildlife Federation, Washington, D.C. 1941. Paper cover, $.60; library buckram, $1.00.

Good little books, the kind you need to read again and again, are all too rare. This is one of them. It should be in every school library and in the personal library of every teacher who is interested in conservation.

In this book, the third of a series of publications on this theme, the National Wildlife Federation presents basic considerations underlying the whole program of conservation education. With the exception of minerals, most of the fundamentals are covered, and in remarkably clear and readable style.

The first section of the book deals with economic aspects of the conservation problem; the second with soil conservation, presenting soil erosion as a destroyer of civilizations; the ABC's of conservation are treated in the third, with emphasis on programs for taking hold of the problem in practical fashion; the fourth gives the best analysis known to the reviewer of the many pitfalls in conservation practice and education; and the last views conservation in its relation to education, with some emphasis on the responsibility of biology teachers.

Easy to read, fertile with new ideas and fresh statements of well-known ones, this little book should be kept at the teacher's elbow for re-reading during spare moments. All who use it will doubtless look forward to the appearance of the next publication in the series, *Teaching Conservation in Public Schools* by Edwin W. Reeder.

Georgia Peabody College for Teachers J. R. WHITAKER

Yearbook of the United States Department of Agriculture, 1941, Superintendent of Documents, Washington, D.C., $1.75.

"Climate and Man," the 1941 United States Department of Agriculture Yearbook, contains much geographic material. It is divided into five parts. Part 1 deals with world climate, both of the past and present. Maps showing distribution of types of climate, vegetation, and soils are given, and the bearing of these factors upon soil erosion is brought out. Part 2 is named "Climate and Agricultural Settlement." It shows the influence of climate upon settlement of the humid, sub-himid, semi-arid, arid, and summer-dry sections of the United States; about ten pages are devoted to each. Puerto Rico and Hawaii are discussed, and Stefansson writes about colonization of northern lands. Part 3, "Climate and The Farmer," starts with a discussion of soils, but is concerned mainly with relationships between climate and nine specific crops. Then follows a discussion of relationships of climate to grazing, forestry, plant diseases, insects, livestock production, and animal parasites. Part 4 is entitled "The Scientific Approach to Weather and Climate." It shows how weather and climate affect floods and flood control. Then a Weather Bureau forecaster describes the steps in making a daily forecast, and illustrates with maps and charts. Some fifty pages are given to a semi-technical explanation of the scientific basis of modern meteorology. The volume ends nearly 600 pages of combined climatic data and descriptions, first for the world as a whole and then, in great detail, for each state of the United States. (New England is treated as a unit.)

Each chapter includes a bibliography. Among the contributors one finds such well-known names as Sauer, Trewartha, Leighly, and others. The book deserves a place upon every geographer's book-shelf.

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